nbn FY09-FY23 Building Block Model handbook

August 2023

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Contents

1 Introduction

1.1 The role of the BBM

The LTRCM currently set out in Module 1 of the SAU was developed to ensure that details of **nbn**'s ABBRR, RAB and ICRA were transparent during the Initial Regulatory Period when **nbn** was focused on building out its networks and migrating users to its network. The operation of the LTRCM means that expenditures on all **nbn** networks (including MTM networks) have been included in the LTRCM where they met the relevant tests in the SAU (such as the Prudent Design Condition and the Prudent Cost Condition), and the RAB and ICRA values determined annually by the ACCC include the totality of **nbn**'s prudently incurred costs.

The Initial Regulatory Period ended on 30 June 2023. For the Subsequent Regulatory Period, which commenced on 1 July 2023, **nbn** proposes to replace the LTRCM with a revised methodology. The BBM is a spreadsheet implementation of this revised methodology that calculates an ABBRR that reflects our prudent and efficient costs – including the RAB as calculated under the Module 1 LTRCM provisions – as well as an ICRA specified in the SAU.

The BBM also contains cost allocations between Core Regulated Services and Competitive Services. This makes **nbn**'s allocation of costs between Core Regulated Services and Competitive Services transparent. These allocations are for the purposes of **nbn**'s SAU only and may not be appropriate for any other purpose, context or circumstance.

The public version of the BBM consists of only the Core Regulated Services components of the BBM.

The BBM has been split into two models:

- A backward-looking model that captures calculations with historical data from FY09 to FY22 and one year of forecasts for FY23 (note that **nbn** will not report its actuals for FY23 to the ACCC until 31 October 2023) – this applies the LTRCM from Module 1, but overlays cost allocation (between Core Regulated Services and Competitive Services) from the start of FY20.

- A forward-looking model from the First Regulatory Cycle (FY24 to FY26) onwards, which captures calculations using forecast data, and runs out to FY40 – this applies the revised methodology under Module 2 (1 July 2023 to 30 June 2032) and assumes that this continues under Module 3 (1 July 2032 to 30 June 2040).

This handbook refers to the backward-looking model.

1.2 How this manual fits with other documents, including the SAU and the Cost Allocation Manual

The BBM reflects the calculations in the revised proposed variation to the SAU lodged by **nbn** in August 2023 (the **Amended SAU Variation**) and the principles in the initial Cost Allocation Manual (**CAM**)[1]. This handbook documents at a high level, for instructive purposes only, how the BBM implements the calculations in the SAU and the principles in the initial CAM.

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[1] The initial CAM lodged in December 2022 in support of the November 2022 SAU variation is interim in nature. Under the Amended SAU Variation, **nbn** will lodge a Proposed CAM for ACCC approval within 30 days of acceptance of the Amended SAU Variation.

nbn has prepared the BBM to support its Amended SAU Variation. The current SAU does not require cost allocation between services or product components. The FY09-FY23 BBM is based on the LTRCM but includes cost allocation.

The BBM calculates, in nominal and real terms, multiple intermediate and final outputs from the application of the Amended SAU Variation, including ABBRR, RAB and ICRA for each Financial Year. As part of this, the BBM allocates between Core Regulated Services and Competitive Services and includes breakdowns of capex, depreciation, opex and asset disposals, and a tax calculation.

The initial CAM documents the methodologies by which **nbn** allocates costs to Core Regulated Services and Competitive Services (using the cost allocation principles proposed in the Amended SAU Variation).

A capitalised term used but not defined in this handbook has the meaning given to it in the Amended SAU Variation.

1.3 Updating this document and process for revision

This document is for users of the FY09-FY23 BBM, which models the FY09 to FY23 Financial Years. Following the end of the First Regulatory Cycle this handbook will not be used for future Financial Years.

2 Model overview

2.1 Structure

The BBM has been set up with a separation between the inputs, allocations, calculations and outputs of the model. The sheets included in the model and the structure of the model can be seen in **Figure 1** and **Figure 2**.

Figure 1: Sheets in the BBM
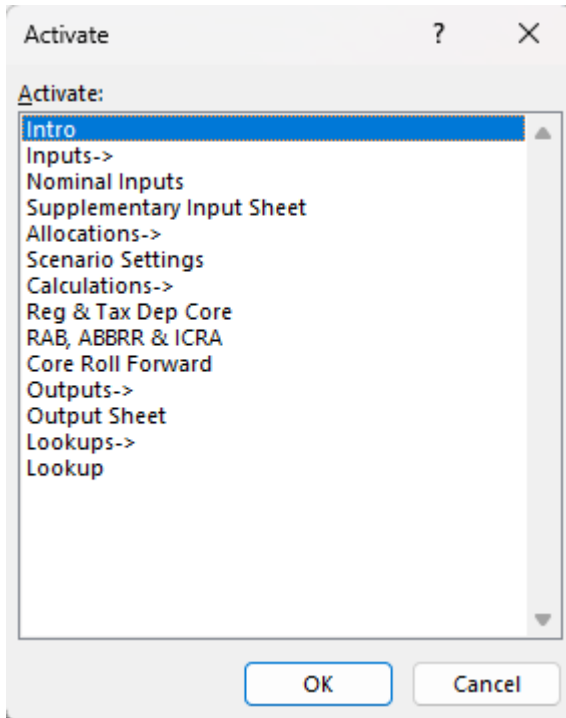
*Source: **nbn***

Figure 2: BBM structure

*Source: **nbn***

2.2 Model conventions

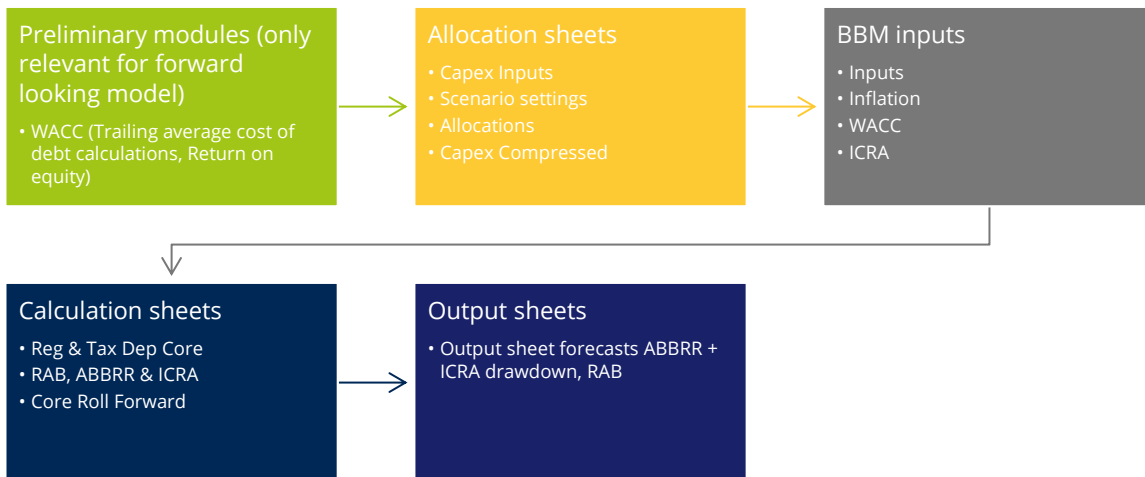**nbn** has developed the BBM based on the spreadsheet used for the purposes of the LTRCM provisions in Module 1 of the SAU. **nbn** has retained the simplified RAB and ICRA build-up sheets from the LTRCM Spreadsheet for transparency. However, one of the greatest differences between the BBM and the LTRCM Spreadsheet is that the BBM implements cost allocation between Competitive Services and Core Regulated Services, including in respect of the RAB, the ICRA. In the public BBM, only Core Regulated Services are visibly modelled, with the allocation to Competitive Services occurring outside the public BBM.

Given the split of the BBM into a backward and forward-looking model, the backward-looking model calculates the roll forward RAB and remaining lives for each Asset Class. This is based on the 600+ asset types that are depreciated in the model.

3 Input sheets

3.1 Nominal inputs

The purpose of the 'Nominal Inputs' sheet is to create a single place to consolidate the main inputs into the BBM. This sheet contains a mix of actuals up to FY22, and forecasts covering FY23.

3.1.1.1 CPI calculations

The CPI calculations in the 'Nominal Inputs' sheet are used throughout the model to adjust data for inflation. The calculations and inputs required for the cumulative inflation factor are found in the 'Nominal Inputs' sheet – see **Figure 3** and **Figure 4** below.

Inflation is applied using the ABS June Quarter CPI (All groups, Weighted Average of Eight Capital Cities) until FY22 then applies the RBA's May 2023 Statement of Monetary Policy RBA Economic Outlook for FY23 (note that at the time the BBM was updated prior to lodgement of the Amended SAU Variation the ABS June Quarter 2023 CPI figure had not yet been released). The inflation factor and the cumulative inflation factor are calculated based on these inputs.

Note that the 'First Financial Year' in the model is FY14, being the financial year in which the SAU was accepted by the ACCC, and all real data is reported in FY14 dollars as per the SAU.

Figure 3: CPI calculations

Year	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
June Quarter CPI (annual percentage change) - as per Dictionary		1.419%	3.122%	3.549%	1.210%	2.390%
Cumulative Inflation Factor		0.877	0.905	0.937	0.948	0.971
Inflation factor (1+June Quarter CPI)		1.01419	1.03122	1.03549	1.01210	1.02390

Source: nbn

Figure 4: June Quarter CPI input data

June Quarter CPI, index number (Source: ABS)					
All Groups, Weighted Average of Eight Capital Cities	91.6	92.9	95.8	99.2	100.4

Source: nbn

3.1.1.2 Asset lives

The asset lives are used in the depreciation calculations. Each asset type has an asset life for each modelling year – see **Figure 5** below.

Asset lives are also used for tax purposes in the nominal tax depreciation calculations. These asset lives are sourced from **nbn**'s financial accounts.

Figure 5: Asset lives example

Asset lifetimes by Asset Type				
Code	Description			
201100	Land	n/a	n/a	n/a
201101	Land - Aggregation Node	n/a	n/a	n/a
201200	Buildings	40	40	40
201201	TAND Air-Conditioning Assets - Packaged Units	5	5	5
201202	TAND Boom Gates	5	5	5
201203	TAND Building Management System	10	10	10
201204	TAND Computers - Free Access Floors in Computer Rooms	50	50	50

Source: nbn

3.1.1.3 Asset additions and subtractions

Capex and disposals at an asset type level use actuals up to FY22 and forecasts for FY23. Capex and disposals are later allocated between Core Regulated Services and Competitive Services as per Section 4. This allocated data is ultimately used in the depreciation calculations and the RAB.

3.1.1.4 Opex

The model uses high-level opex inputs, with actuals up to FY22 and forecasts for FY23). There are separate opex inputs for Core Regulated Services and Competitive Services, but only the opex for Core Regulated Services is displayed in the public BBM.

3.1.1.5 Interest expense

Actual interest expense uses actuals up to FY22 and forecasts for FY23. Interest expense is used in the tax calculations in the backward-looking BBM.

3.1.1.6 Construction in progress

Construction in progress (CIP) includes a yearly actual and forecast CIP for a start and end of the period. These data are used in the calculation of the ABBRR.

3.1.1.7 Revenue

Revenue uses actuals up to FY22 and forecasts for FY23.

3.2 WACC

The nominal WACC is calculated as the risk free rate plus 3.5%, which is the historical methodology set out in Module 1 of the SAU. The risk free rate for the backward looking BBM is explained further in Section 3.3 below.

3.3 Risk free rate supplement

The 'Supplementary Input Sheet' is a historic sheet where RBA data has been input to calculate the risk-free rate of interest on a yearly basis. Under Module 1 of the SAU, the risk free rate of interest is calculated on a moving average basis from the mean annualised yield on Commonwealth Government securities with a maturity of 10 years, averaged over the final 20 business days of the preceding financial year and using the indicative mid rates published by the RBA.

The historic risk-free rate is not used in the forward-looking WACC calculations (i.e., for the BBM beyond 30 June 2023). The Amended SAU Variation contains a general method for determining the WACC in the Subsequent Regulatory Period, and **nbn** has proposed WACC estimates based on a specific approach that is consistent with the general method.

4 Allocations

Allocations of costs between Core Regulated Services and Competitive Services, for the purposes of the BBM, are confidential and are visible in the confidential model only. The following information in Sections 4.1 and 4.2 relates to the methodology used in the confidential version of the BBM.

The allocation to Competitive Services commences in FY20, based on when such services were introduced at scale. While **nbn** began supplying Competitive Services prior to FY20, the relatively low volumes meant that any cost allocation would have produced negligible impacts to the backward-looking BBM as it relates to Financial Years prior to FY20.

As noted in Section 3.1.1.4, the opex inputs to the BBM are already split between Core Regulated Service and Competitive Services.

4.1 Allocators

The allocators for individual Asset Classes are defined on the 'Scenario Settings' sheet.

Different allocators are selectable for capex type (e.g., whether it is direct to a cost category, or shared) and allocation methodology (e.g., premises passed). This feeds into the Allocations sheet which determines the allocation between Core Regulated Services and Competitive Services. Where the asset type is reported along with a cost category, 100% of the cost is allocated/attributed to that cost category (e.g., 'Network Assets – FTTP – Local Joint' is fully allocated to FTTP (a Core Regulated Service)).

The public BBM provides transparency on whether asset types are Core or Shared assets but does not include the percentage allocation that is applied to Competitive and Shared assets.

The allocation sheet also allocates asset types to Asset Classes. They are used at the end of the model to calculate a remaining life and remaining value for each Asset Class.

Figure 6: Allocations snapshot

RAB Code	Description	Allocation Methodology	Capex Type	Asset Class
201100	Land	Premise_Passed	Overhead	Land
201101	Land - Aggregation Node	Premise_Passed	Overhead	Land
201200	Buildings	Premise_Passed	Overhead	Buildings
201201	TAND Air-Conditioning Assets - Packaged Units	Premise_Passed	Shared	IT Long
201202	TAND Boom Gates	Premise_Passed	Shared	IT Long
201203	TAND Building Management System	Premise_Passed	Shared	Fitout
201204	TAND Computers - Free Access Floors in Computer Rooms	Premise_Passed	Shared	Buildings
201205	TAND Data Module	Premise_Passed	Shared	Fitout
201206	TAND Fire Control - Detection & Alarm Systems	Premise_Passed	Shared	Fitout
201207	TAND Fire Control - EWIS	Premise_Passed	Shared	Fitout
201208	TAND Fire Control - Fire Extinguishers	Premise_Passed	Shared	Fitout
201209	TAND Fire Control - Gas Suppression	Premise_Passed	Shared	Buildings

*Source: **nbn***

4.2 Allocations

The Allocations sheet uses a combination of inputs and calculations to determine appropriate allocations to attribute costs.

The initial CAM refers to the reasons and methodology behind the allocations in the BBM.

The allocation uses a specific coding of each Asset Class into different Capex types – cost category specific (e.g., FTTP), shared across fixed line, shared across all networks, or overhead (see 'Allocators' below). Costs directly attributable to specific cost categories are allocated directly to Core Regulated Services or Competitive Services (as appropriate). The BBM allocates costs that cannot be directly attributed to each cost category – i.e., asset types that have shared elements across all cost categories (e.g., transit network, transit and distribution fibre). The allocation of costs to cost categories is based on the fixed asset register. Where the asset type is not reported against a specific cost category, the residual is allocated based on whether it is shared across all cost categories (where traffic flow through gets aggregated) or shared within fixed line cost categories (mainly distribution fibre). This allocation is used along with one of the allocators (as appropriate) shown in **Table 1**. The details of each allocator type, including the respective underlying methodologies, are set out in the initial CAM.

Table 1: **Allocators**

Category	Asset Examples	Rationale
Premises Passed (Share of network footprint)	TAND, FAN Site Physical Plants. Office equipment and corporate software licenses.	Shared physical and non-network assets costs are not directly driven by number of customers and bandwidth consumed, therefore allocated based on total intended footprint
Premises Connected (Share of active services)	Exchange and transit equipment	Shared network assets sensitive to number of customers connected (i.e., constrained by number of ports)
Provisioned Bandwidth (Share of bandwidth demand)	Distribution Fibre and supporting ducts and pits	Shared network assets sensitive to the total bandwidth demand on the network (i.e., constrained by total throughput)

*Source: **nbn***

The Allocations sheet calculates a percentage of Competitive Services capex for each cost category under each of these allocators to be applied to the raw capex data depending on the selected allocation. This percentage is based on actuals and forecasts. The raw data is merged to achieve a share across the cost categories.
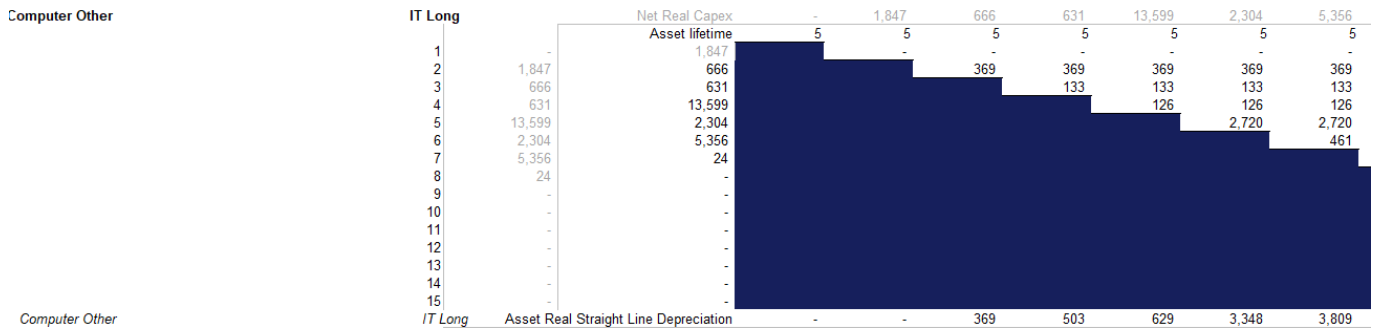
5 Calculation sheets

5.1 Depreciation

Depreciation is calculated for both Core Regulated Services and (as a consequence of the obligation to calculate depreciation in respect of the entire RAB) Competitive Services. These calculations are made in separate sheets. The public BBM presents only the depreciation for Core Regulated Services.

Each sheet calculates the real straight-line depreciation and nominal tax depreciation for each asset type – see (Figure **6**).

Figure 6: Depreciation on forecast capex

*Source: **nbn***

5.2 RAB, ABBRR & ICRA

The Core Services RAB, ABBRR & ICRA is calculated on the 'RAB, ABBRR & ICRA' sheet, together with their respective components. This sheet contains the primary calculations in the model. It calculates the RAB roll forward and ABBRR/ ICRA calculations on a total basis (see **Figure 7**).

Figure 7: RAB, ABBRR & ICRA

2. Regulatory Asset Base ($'000 REAL)

Real RAB (start period)
    Core
    Competitive
  Real Capex
      Core
      Competitive
  Real Disposals
      Core
      Competitive
  Real Straight Line Depreciation
      Core
      Competitive
Real RAB (end period)
    Core
    Competitive

3. Regulatory Asset Base ($'000 NOMINAL)

Nominal RAB (start period)
    Core
    Competitive
  Nominal Straight Line Depreciation
      Core
      Competitive
Nominal RAB (end period)
    Core
    Competitive

4. ABBRR ($'000 NOMINAL)

Return on capital
    Core
    Competitive

Nominal Regulatory Depreciation
    Core
    Competitive

Nominal Opex
    Core
    Competitive

Net Tax Allowance (as calculated in Table 5 below)
    Core
    Competitive

ACIPA
    Core
    Competitive

ABBRR
    Core
    Competitive

Source: nbn

5.3 Roll forward

5.3.1 Streamlined depreciation calculation

In the forward-looking BBM, which is applicable from FY24, **nbn** is taking a streamlined approach to calculating depreciation.   The following description is included in this BBM Handbook in relation to the backward-looking BBM because the Weighted Average Remaining Lifetimes for Asset Classes as at the start of FY24 are calculated in the backward-looking BBM and transferred across to the forward-looking BBM.

5.3.1.1 Asset Classes

The streamlined approach involves grouping asset types into Asset Classes for the purpose of depreciation. Asset types are grouped into Asset Classes by function and the services they deliver. This approach improves the usability by reducing the volume of calculations in the model, replacing over 600 line-by-line depreciation calculations with less than 20 Asset Class depreciation calculations.

nbn has used the following Asset Classes:

- Land
- Buildings
- Fitout
- Indirect Capital Assets
- Inventory
- Distribution Local
- Passive Infrastructure
- Network Termination Device
- Transit
- Active Plant
- IT Long
- Remediation
- IT Short
- Distribution Long
- Access Network
- FW Grants

nbn is proposing to differentiate within Asset Classes between assets commissioned prior to FY24, and those after FY24.

5.3.1.2 Approach to calculating a weighted average remaining lifetime

In Module 2, under clause 2G.5.5 in the Amended SAU Variation, depreciation calculations require a standard life for new capital expenditure and a remaining life for an Asset Class to be used for the capex incurred in that Asset Class prior to the commencement of a Regulatory Cycle.

In **nbn**'s FY24-FY40 BBM, each Asset Class has a Standard Asset Life and a calculated Weighted Average Remaining Lifetime. Depreciation is calculated and applied in the BBM at the Asset Class level (aggregated across asset types) using the Weighted Average Remaining Lifetime for the capex in that Asset Class that has been incurred prior to the First Regulatory Cycle, and Standard Asset Lifetime for the capex in that Asset Class incurred during the First Regulatory Cycle.

The FY09-FY23 BBM calculates the remaining value of each Asset Class by considering the opening RAB, the capex incurred, disposals, and depreciation, in accordance with a standard RAB roll-forward approach[2].

The BBM calculates a remaining life for each Asset Class by dividing the amount of the real RAB associated with each Asset Class, as at the date on which the Weighted Average Remaining Lifetime is determined, by the sum of

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[2]   Clause 2G.5.3 of Module 2 of the SAU also applies this standard roll-forward approach.

annual depreciation in that Asset Class. The weights in this calculation are the contribution to depreciation from each individual assets in the Asset Class.

$$Weighted\ Average\ Remaining\ Lifetime_i = \sum_a RL_a \frac{real\ depreciation_a}{\sum_a real\ depreciation_a} = \frac{\sum_a closing\ real\ RAB_a}{\sum_a real\ depreciation_a}$$

Where i is an Asset Class, a denotes each asset type specified in Asset Class i, and RL_a is the remaining life for asset type a.

Box 1 sets out a worked example of the Weighted Average Remaining Lifetime depreciation calculation.

Box 1: Worked example of Weighted Average Remaining Lifetime calculation

Assume we are seeking to calculate a Weighted Average Remaining Lifetime for Asset Class A at the end of the regulatory cycle for the capex incurred during a five year regulatory cycle. Over the 5 years, there were 3 asset types that each incurred capex with different <u>remaining</u> lives as shown in **Table 2**. Annual depreciation begins the year after the capex is incurred as shown in **Table 3**.

Table 2: Asset expenditure and life

Expenditure	Asset life	Year 1	Year 2	Year 3	Year 4	Year 5
Asset type 1	6	$200,000				
Asset type 2	6		$5,000,000			
Asset type 3	10				$15,000,000	

Source: Frontier Economics

Table 3: Annual depreciation

Annual depreciation	Year 1	Year 2	Year 3	Year 4	Year 5
Asset type 1		$33,333	$33,333	$33,333	$33,333
Asset type 2			$833,333	$833,333	$833,333
Asset type 3					$1,500,000

Source: Frontier Economics

Asset type 1 incurred in the first year of the Regulatory Cycle will have a different remaining value and remaining life than Asset type 3 that was incurred in Year 4, as shown in **Table 4**.

Table 4: Remaining value and remaining life of the assets

Asset	Remaining value	Remaining life
Asset type 1	$66,667	2
Asset type 2	$2,500,000	3
Asset type 3	$13,500,000	9

As such, in calculating the Weighted Average Remaining Lifetime, Asset type 3 that has a large remaining value and long remaining life will increase the average.

The Weighted Average Remaining Lifetime for this Asset Class A is 6.8.

$$WARL_A = \frac{66,667 + 2,500,000 + 13,500,000}{33,333 + 833,333 + 1,500,000} = 6.8$$

nbn applied this methodology in the FY09-23 BBM to calculate a Weighted Average Remaining Lifetime for each Asset Class on the Core Roll Forward and Competitive Roll Forward sheets (with only the Core Roll Forward sheet being visible in the public-facing version). The outputs of this calculation are presented in **Figure 8**.

Figure 8: Core Roll Forward output

Opening Regulatory Asset Base and Opening Tax Base - Core		Opening Asset Value	Assets Under Construction	Remaining Life	Standard Life	Opening Tax Value	Tax Remaining Life	Tax Standard Life
Code	Description							
201100	Land	17,071		n/a	n/a	12,792	n/a	n/a
201101	Buildings	107,668		34.95	45	85,312	35.24	45
201200	Fitout	131,816		8.68	15	107,531	8.82	15
201201	Indirect Capital Assets	1,524,546		6.20	10	1,286,788	6.12	10
201202	Inventory	70,430		n/a	n/a	56,260	n/a	n/a
201203	Distribution Local	2,242,948		15.85	25	1,995,535	20.25	25
201204	Passive Infrastructure	4,321,442		36.08	40	4,784,988	36.82	40
201205	NTD	4,366,061		4.40	8	3,684,789	3.83	8
201206	Transit	-		n/a	25	-	n/a	25
201207	Active Plant	4,557,103		6.37	7	3,997,532	6.04	7
201208	IT Long	1,938,734		4.29	7	1,738,644	4.40	7
201209	Remediation	30,826		1.00	1	30,826	1.00	1
201210	IT Short	220,887		1.62	4	198,598	1.68	4
201211	Distribution Long	9,091,540		33.63	40	7,814,960	35.49	40
201212	Access Network	1,818,967		8.41	12	1,540,334	8.87	12
201213	FW Grants	-		n/a	10	-	n/a	10
201214	Spare 4	-		n/a	n/a	-	n/a	n/a
201215	Spare 5	-		n/a	n/a	-	n/a	n/a
201216	Spare 6	-		n/a	n/a	-	n/a	n/a
201217	Spare 7	-		n/a	n/a	-	n/a	n/a
Total		30,440,039.49	-			27,334,887.42		

Source: nbn

5.3.2 Roll forward inputs

As outlined above, as the backward-looking model stops at the end of the Initial Regulatory Period (30 June 2023), inputs are required for the forward-looking model beginning in the Subsequent Regulatory Period (from 1 July 2023). In the backward-looking model, these inputs are calculated on the Roll Forward sheet, and calculates/reports:

- Opening asset value as at 1 July 2023
- Remaining life
- Standard life
- Opening tax value
- Tax remaining life
- Tax standard life

6 Output sheets

6.1 Outputs

This sheet summarises the outputs of the main calculation sheets. In the forward-looking BBM (but not the backward-looking BBM), this sheet is used to create an outputs table that is set out in the Amended SAU Variation. The public BBM presents the outputs for Core Regulated Services (**Figure 9**).

Figure 9: Outputs

Core Regulated Services

Nominal Forecast Core Services RAB Portion (start period)
Nominal Forecast Core Services RAB Portion (end period)
Forecast Real Core Services RAB Portion (start period)
Forecast Real Core Services RAB Portion (end period)
Nominal Forecast Core Services Capital Expenditure
Real Forecast Core Services Capital Expenditure
Nominal Forecast Core Services Disposals
Real Forecast Core Services Disposals
Real Forecast Core Services Depreciation
Forecast Nominal Tax Depreciation in connection with the forecast Nominal Core Services RAB Portion
Forecast nominal regulatory depreciation in connection with the forecast Nominal Core Services RAB Portion
Nominal Forecast Core Services Operating Expenditure
Nominal Forecast Construction in Progress in connection with Core Regulated Services (start period)
Forecast Annual Construction in Progress Allowance (nominal) in connection with Core Regulated Services
Forecast Core Services Tax Allowance (nominal)
Forecast Nominal Core Services ABBRR
Forecast Real Core Services ABBRR
Nominal Annual Drawdown of ICRA
Forecast Annual Core Revenue Allowance
Forecast Core Services Revenue Cap
Annual Core Services Forecast Revenue

*Source: **nbn***